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APPLICATION NO.	FILED DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/434,282	11/05/1999	THIERRY CHAPUS	PET-1581-D1	3767
23599	7590	11/26/2003	EXAMINER	
MILLEN, WHITE, ZELANO & BRANIGAN, P.C. 2200 CLARENDON BLVD. SUITE 1400 ARLINGTON, VA 22201			LEUNG, JENNIFER A	
		ART UNIT	PAPER NUMBER	
			1764	

DATE MAILED: 11/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	09/434,282	CHAPUS ET AL.
<b>Examiner</b>	<b>Art Unit</b>	
Jennifer A. Leung	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 12 August 2003.

2a)  This action is **FINAL**.                            2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## **Disposition of Claims**

4)  Claim(s) 11,12,15,16 and 18-30 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 11,12,18-26 and 28-30 is/are rejected.

7)  Claim(s) 15,16 and 27 is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. 08/936,101.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.  
13)  Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a)  The translation of the foreign language provisional application has been received.  
14)  Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)      4)  Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_ .  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)      5)  Notice of Informal Patent Application (PTO-152)  
3)  Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.      6)  Other: \_\_\_\_\_ .

## DETAILED ACTION

### *Response to Amendment*

1. Applicant's amendment filed on August 12, 2003 has been received and carefully considered. The changes made to the Specification are acceptable. Claims 1-10, 13, 14 and 17 are cancelled. Claims 25-30 have been added. Claims 11, 12, 15, 16 and 18-30 remain active.

### *Response to Arguments*

2. Applicant's arguments filed on August 12, 2003 with respect to the rejection of claims 12 and 16 under 35 U.S.C. 103(a) as being unpatentable over Parker et al. (US 3,457,163) in view of Louie et al. (US 4,4990,242) have been fully considered and are persuasive. Therefore, said rejections have been withdrawn.

3. Applicant's arguments filed on August 12, 2003 with respect to the rejections in view of Parker et al. alone or in combination with Cosyns et al., and Louie et al. in combination with Guth et al., have been fully considered but they are not persuasive.

\* \* \*

A. Rejection under 35 U.S.C. 102(b) as being anticipated by Parker et al. (US 3,457,163)  
On page 10 (first paragraph) of the response, Applicants argue,

“The process includes a separator 15, a reactor 21, and a reactor 34. However, Parker does not teach or suggest a stripping zone. Rather, U.S. ‘163 teaches a separation zone, which can encompass a vast array of separating mechanisms.”

However, the examiner respectfully disagrees. As defined by one of ordinary skill in the art, the process of stripping comprises, “The separation of the more-volatile components of a liquid mixture from the less-volatile components,” (see Peyton, “Useful Terms and Definitions”, page 355). Additionally, as disclosed by Parker et al. (column 7, lines 15-22),

*“The total effluent from reactor 34 is withdrawn via line 35 and passed into recovery facilities which would include a separation zone wherein a hydrogen fraction containing hydrogen sulfide gas may be recovered, the hydrogen sulfide gas separated, and the hydrogen-containing fraction preferably recycled to reactor 34. These recovery facilities are well known to those skilled in the art and have not been shown for convenience.”* (with emphasis added).

In the instant case, the “more-volatile component” would comprise the disclosed “hydrogen fraction containing hydrogen sulfide gas”, and the “less-volatile component” would comprise the “effluent from reactor 34” minus the “hydrogen fraction containing hydrogen sulfide gas” removed in the separation zone. Thus, the “separation zone” of Parker inherently comprises the “stripping zone” as recited by applicants.

\* \* \*

B. Rejection under 35 U.S.C. 103(a) as being unpatentable over Parker et al. (US 3,457,163) in view of Cosyns et al. (US 4,208,271).

On page 12 (second paragraph) of the response, Applicants argue,

*“[Cosyns et al.] fails to teach to suggest a stripping zone and thus cure the deficiencies of U.S. ‘163, as discussed above.”*

The examiner respectfully disagrees, for the reasons set forth above in view of Parker et al.

\* \* \*

C. Rejection under 35 U.S.C. 103(a) as being unpatentable over Louie et al. (US 4,990,242) in view of Guth et al. (US 3,847,800).

On page 12 (third paragraph) of the response, Applicants argue,

*“U.S. ‘242 is silent with respect to the disclosure of any sweetening zone. Applicants traverse the assertion that caustic washing liquid products at column 6, lines 37-40, constitute a sweetening zone as in the context of the present invention. In particular, there is no disclosure or suggestion concerning a sweetening zone upstream of a hydrotreatment zone or downstream of a stripping zone. Moreover, the citation of U.S. ‘800 fails to cure this deficiency.”* (with emphasis added).

However, the examiner respectfully disagrees. As defined by one of ordinary skill in the art, the process of sweetening comprises the, “Removal of the objectionable odors due to the presence of H<sub>2</sub>S and mercaptans,” wherein, “Several method can be utilized to remove these undesirable compounds including *caustic washing*, copper chloride sweetening, sulfuric acid treating, Merox processing, and hydrotreating.” (see Peyton, “2. Sweetening Processes”, page 27-28). Therefore, the, “... light caustic wash to assure complete removal of H<sub>2</sub>S,” as disclosed by Louie et al. (column 6, lines 37-61) inherently comprises a “sweetening zone” as recited by applicants.

***Allowable Subject Matter***

4. Claims 15, 16 and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 11, 18-21 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Parker (U.S. 3,457,163).

Regarding claims 18 and 26, Parker (generally, column 2, lines 11-29; column 3, lines 19-73) discloses an apparatus comprising:

a fractionation column 15 having a gas inlet line 14, a first discharge line 17 for removing a first gasoline cut from an upper portion of column 15, and a second discharge line 16 for

removing a second gasoline cut from a lower portion of column **15** (FIG; column 5, line 64 to column 6, line 4);

a hydrotreatment zone **34** comprising a catalytic bed, a gasoline cut inlet line **33** for introducing the first gasoline cut, said gasoline cut inlet line **33** being in fluid communication with said first discharge line **17** of column **15**, said hydrotreatment zone **34** also comprising a hydrotreated effluent outlet line **35** (FIG; column 6, lines 5-16; column 7, lines 3-16); and

a stripping zone (i.e., "separation zone") in fluid communication with said hydrotreated effluent outlet line **35** of hydrotreatment zone **34**. Although Parker does not explicitly recite a "hydrotreated gas inlet", a "H<sub>2</sub>S outlet line" or a "stripped gasoline outlet line", such inlets and outlets are inherent of the apparatus, to enable the disclosed introduction of effluent into the separation zone, separation of H<sub>2</sub>S and recovery of product (FIG; column 7, lines 15-22).

Parker further discloses a treatment zone **21** in fluid communication with said first discharge line **17** and said hydrotreatment zone **34**, treatment zone **21** having a gas cut inlet **20** connected to said first discharge line **17**, a treated gasoline cut outlet line **22** and at least one catalytic bed containing 0.1 to 1% of palladium on a support (i.e., a preferred catalyst comprising 0.05% to about 5% by weight of palladium on an alumina support; column 5, lines 1-21).

Regarding claim 11, Parker (column 6, lines 5-39; claim 5, step (c); FIG.) discloses the treatment zone **21** comprises a selective diene hydrogenation zone, said zone being located between said fractionation column **15** and said hydrotreatment zone **34**, said selective diene hydrogenation zone comprising a gasoline inlet line **20** in fluid communication with said first discharge line **17** for introducing the first gasoline cut, and a dedienized first gasoline cut outlet line **22** in fluid communication with said gasoline cut inlet line **33**.

Regarding claim 19, Parker discloses said catalytic bed in said hydrotreatment zone **34** contains a catalyst having at least one group VIII metal, at least one group VI metal, or a combination thereof (i.e. comprising nickel and molybdenum; column 7, lines 3-14).

Regarding claim 20, Parker discloses said selective diene hydrogenation zone **21** contains a catalyst comprising at least one group VIII metal and a support (i.e. palladium on alumina; column 5, lines 1-21)

Regarding claim 21, Parker discloses said catalyst of said selective diene hydrogenation zone **21** comprises 0.1 to 1% of palladium deposited on a support (i.e. comprising 0.05% to about 5% by weight of palladium on an alumina support; column 5, lines 1-21).

Instant claims 11, 18-21 and 26 structurally read on the apparatus of Parker.

#### *Claim Rejections - 35 USC § 103*

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parker (U.S. 3,457,163) in view of Cosyns et al. (U.S. 4,208,271).

Regarding claim 22, Parker is silent as to whether the catalyst of the selective diene hydrogenation zone **21** may further comprise 1 to 20% by weight nickel. However, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select

such a catalyst for the selective diene hydrogenation zone in the apparatus of Parker, on the basis of suitability for the intended use and absent showing unexpected results thereof, since catalysts comprising nickel are conventionally known in the art of selective hydrogenation, as evidenced by Cosyns et al. (column 1, lines 41-42), and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller*, 105 USPQ 233. In addition, Cosyns et al. teach a catalyst composition for selective hydrogenation comprising palladium and nickel, wherein the palladium content is preferably from 0.1 to 0.5 weight % and the nickel content is preferably from 5 to 20 weight % (column 3, lines 9-12).

Regarding claim 23, Cosyns et al. teach that said catalyst comprises a first catalyst zone and a second catalyst zone, wherein said first catalyst zone is disposed upstream of said second catalyst zone (i.e. "gasoline and hydrogen are first passed over a catalyst comprising supported palladium metal [the first catalyst bed], and then over a catalyst comprising supported nickel metal [the second catalyst bed]; column 2, lines 1-16). Thus, inherently, the first catalyst zone would be in fluid communication with the gasoline inlet line **20**, and said second catalyst zone would be in fluid communication with said first catalyst zone and said dedienized first gasoline cut outlet line in the modified apparatus of Parker, in order to enable the successive passing of gasoline and hydrogen over the first catalyst bed and subsequently the second catalyst bed. It would have been obvious for one of ordinary skill in the art at the time the invention was made to provide such a dual bed configuration for the catalyst of the modified apparatus of Parker, because the configuration obviates the disadvantages of prior art selective hydrogenation catalysts, such as low catalytic activity in highly sulfurous streams, as taught by Cosyns et al.

(column 1, line 39 to column 2, line 16).

Regarding claim 24, Cosyns et al. further teach that said first catalyst zone is at most 75 volume % of the total volume of said first catalyst zone and said second catalyst zone (i.e., 1/3 of the total catalyst volume; column 4, EXAMPLE 3).

7. Claims 12, 18, 25 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Louie et al. (U.S. 4,990,242) in view of Guth et al. (U.S. 3,847,800).

Regarding claim 18, 25 and 29, Louie et al. (FIG. 1) discloses an apparatus comprising:  
a fractionation column **2** having a gas inlet line **1**, a first discharge line **3** at an upper portion of column **2**, and a second discharge line **4** at a lower portion of column **2** (column 4, lines 3-21);

a hydrotreatment zone **9** comprising a catalytic bed, a gasoline cut inlet line for introducing the first gasoline cut, said gasoline cut inlet line being in fluid communication with said first discharge line **3** of said fractionation column **2**, said hydrotreatment zone also comprising a hydrotreated effluent outlet line **11** (column 4, lines 22-54); and

a stripping zone **17** comprising a hydrotreated gas inlet in fluid communication with said hydrotreated effluent outlet line **11** of said hydrotreatment zone **9**, an H<sub>2</sub>S outlet line ("H<sub>2</sub>S SCRUBBING" line), and a stripped gasoline outlet line **19** (column 6, lines 23-36).

Louie et al. further disclose that subsequent to the stripping zone, "in many cases, the liquid products are given a light caustic wash to assure complete removal of H<sub>2</sub>S," (column 6, lines 37-61), thereby comprising a further sweetening zone. However, Louie et al. are silent as to whether the removal of H<sub>2</sub>S in the sweetening zone may be accomplished by introducing an oxidizing agent into the zone.

Guth et al. teach a method and apparatus for the removal of sulfur compounds present in a broad range of sulfur compounds, including hydrogen sulfide, wherein a sweetening zone comprises a gas inlet (“OIL FEED”), an oxidizing agent supply line 13 for introducing oxidizing agent (i.e. NO<sub>2</sub>), and a stripped and sweetened gasoline outlet line (“LOW SULFUR OIL OUTPUT”) (column 3, line 36 to column 4, line 30; FIG. 1). It would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to substitute the means for removal of sulfur compounds as taught by Guth et al. for the sweetening zone in the apparatus of Louie et al, on the basis of suitability for the intended use and absent showing unexpected results thereof, since the means of both Louie et al. and Guth et al. serve substantially the same function and effect of removal of sulfur compounds, and it has been held that the substitution of one known equivalent technique for another may be obvious even if the prior art does not expressly suggest the substitution. *Ex parte Novak* 16 USPQ 2d 2041 (BPAI 1989); *In re Mostovych* 144 USPQ 38 (CCPA 1964); *In re Leshin* 125 USPQ 416 (CCPA 1960); *Graver Tank and Manufacturing Co. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950). Also, the provision of “a gas inlet in fluid communication with said stripped gas outlet line [19]”, “an oxidizing agent supply line for introducing oxidizing agents to said sweetening zone”, and “a stripped and sweetened gasoline outlet line” will be inherent of the modified apparatus of Louie et al., in order to enable the feeding of reactants and recovery of product. Furthermore, the provision of inlets and outlets is well known to those skilled in the art.

Regarding claim 12, Louie et al. (FIG. 1; column 4, line 3 to column 6, line 61) disclose a hydrotreating zone 10 for hydrotreating the second gasoline cut 4, said hydrotreating zone 10 having a gasoline cut inlet line which is in fluid communication with the second discharge line 4

for introducing the second gasoline cut from said fractionation column **2**, a first hydrotreated cut outlet line **12**, and a hydrogen supply line **6** connected to said second discharge line **4**, and a stripping column **18** having a hydrotreated cut inlet line in fluid communication with said first hydrotreated cut outlet line **12**, an H<sub>2</sub>S outlet line (“H<sub>2</sub>S SCRUBBING” line), and a second hydrotreated cut outlet line (exiting **18** and in flow communication with **19**).

Regarding claim 28, Louie et al. disclose the first discharge line **3** is directly connected to the hydrotreatment zone **9** (see Figure).

Regarding claim 30, Louie et al. disclose the gasoline cut inlet line (i.e., the inlet line to hydrotreatment zone **9**) is adapted to receive the entire amount of the first gasoline cut (via line **3**) from the upper portion of the fractionation column **2** (see Figure).

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Peyton has been provided to illustrate the state of the art of finishing processes for refined and blended fuels, and in particular, to define the terms “sweetening” and “stripping”, as commented above under the “Response to Arguments”.

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

\* \* \*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951. The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Calderola can be reached on 703-308-6824. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer A. Leung  
November 24, 2003 *gjl*

*Hiem Tran*

HIEN TRAN  
PRIMARY EXAMINER